

What is claimed is:

1. A heat curable extruded adhesive laminate system, said system comprising:

5 a fabric;

an extruded adhesive having a latent thermally activated curing component comprising a uretdione, said extruded adhesive being coated onto the fabric; and

10 a thermoplastic resin, said thermoplastic resin being coated onto the extruded adhesive, thereby forming the heat curable extruded adhesive laminate.

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2. A heat curable extruded adhesive laminate system, according to claim 1, said system further comprising heating panels of the heat curable extruded adhesive laminate to a temperature from about 260°F to about 350°F in a compression press, thereby forming collapsible tanks.

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3. The heat curable extruded adhesive laminate system, as claimed in claim 1, wherein said extruded adhesive is comprised of a thermoplastic polyurethane with pendant hydroxyl groups.

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4. The heat curable extruded adhesive laminate system, as claimed in claim 3, wherein said thermoplastic resin is a thermoplastic polyurethane resin.

5. The heat curable extruded adhesive laminate system, as claimed in claim 4, wherein said thermoplastic polyurethane with pendant hydroxyl groups has a medium to a high level of crystallinity.
- 5 6. The heat curable extruded adhesive laminate system, as claimed in claim 5, wherein the uretdione is a dimer of a diisocyanate, a multi-uretdione adduct or a combination thereof.
7. The heat curable extruded adhesive laminate system, as claimed in claim 6, wherein the uretdione is selected from the group consisting of dimers of TDI. MDI, XDI, IPDI, H<sub>12</sub>MDI  
10 and HMDI.
8. A heat curable extruded adhesive laminate system, according to claim 1, wherein the extruded adhesive with a latent thermally activated is further comprised of a cross-linking enhancer.
- 15 9. The heat curable extruded adhesive laminate system, as claimed in claim 8, wherein the cross-linking enhancer is a compound with at least two hydroxyl groups.
10. The heat curable extruded adhesive laminate system, as claimed in claim 9, wherein the cross-linking enhancer is selected from the group consisting of: a hydroxyalkylamide, pentaerythritols; mono, di and tri alkanol amines; glycols; abitol; butylene glycol; cyclohexanedimethanol; diethylene glycol; dipentaerythritol; dipropylene glycol; glycerine; hexylene glycol; hydrogenated Bisphenol A; methyl 1,2 propanediol; neopentylglycol;

propylene glycol; sorbitol; triethylene glycol; trimethylolpropane; tripentaerythritol, alkoxy and hydroxyl alkoxy cellulose, simple sugars like fructose, sucrose, glucose and starches.

11. A heat curable extruded adhesive laminate system, according to claim 1, wherein the  
5 extruded adhesive with a latent thermally activated is further comprised of a hydrolytic stabilizer.
12. The heat curable extruded adhesive laminate system for producing collapsible tanks, as claimed in claim 11, wherein the hydrolytic stabilizer is selected from the group consisting  
10 of carbodiimides, polycarbodiimide and epoxidized soy bean oil.
13. The heat curable extruded adhesive laminate system, as claimed in claim 1, wherein the thermoplastic resin is compounded to include other additives such as reinforcing fibers, extenders, fillers, antioxidants, UV stabilizers, thermal stabilizers, flame retardants, glass  
15 beads, colorants, antimicrobial agents, dyes, pigments, processing aides (i.e. waxes, fluorinated compounds, silicone compounds, surfactants, polymeric processing aides), density modifiers such as phenolic beads, desiccants, buffers, and IR absorbent compounds to facilitate heating (i.e. carbon blacks, graphite, metal oxides).
- 20 14. The heat curable extruded adhesive laminate system, as claimed in claim 1, wherein the said extruded adhesive is further compounded to include other additives such as reinforcing fibers, extenders, antioxidants, UV stabilizers, thermal stabilizers, flame retardants, fillers, glass beads, colorants, antimicrobial agents, dyes, pigments, processing aides (i.e. waxes, fluorinated compounds, silicone compounds, surfactants, polymeric processing aides),

density modifiers such as phenolic beads, desiccants, buffers, and IR absorbent compounds to facilitate heating (i.e. carbon blacks, graphite, metal oxides).

15. A one pass heat curable extruded adhesive laminate system, said system comprising:

5 a fabric;

an extruded mixture of a thermoplastic resin, a thermoplastic polyurethane having pendant hydroxyl groups, and a latent thermally activated curing component; wherein said extruded mixture is coated onto the fabric, thereby forming the one pass heat curable extruded adhesive laminate.

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16. A one pass heat curable extruded adhesive laminate system, according to claim 15, said one pass system further comprising heating panels of the one pass heat curable extruded adhesive laminate to a temperature from about 260°F to about 350°F in a compression press, thereby forming collapsible tanks.

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17. The one pass heat curable extruded adhesive laminate system, as claimed in claim 1, wherein said extruded adhesive is comprised of a thermoplastic polyurethane with pendant hydroxyl groups.

20 18. The one pass heat curable extruded adhesive laminate system, as claimed in claim 17, wherein said thermoplastic resin is a thermoplastic polyurethane resin.

19. The one pass heat curable extruded adhesive laminate system, as claimed in claim 18, wherein said thermoplastic polyurethane with pendant hydroxyl groups has a medium to a high level of crystallinity.

5 20. The one pass heat curable extruded adhesive laminate system, as claimed in claim 19, wherein the uretdione is a dimer of a diisocyanate, a multi-uretdione adduct or a combination thereof.

10 21. The one pass heat curable extruded adhesive laminate system, as claimed in claim 20, wherein the uretdione is selected from the group consisting of dimers of TDI. MDI, XDI, IPDI, H<sub>12</sub>MDI and HMDI.

15 22. A one pass heat curable extruded adhesive laminate system, according to claim 15, wherein the extruded adhesive with a latent thermally activated is further comprised of a cross-linking enhancer.

20 23. The one pass heat curable extruded adhesive laminate system, as claimed in claim 22, wherein the cross-linking enhancer is a compound with at least two hydroxyl groups.

24. The one pass heat curable extruded adhesive laminate system, as claimed in claim 23, wherein the cross-linking enhancer is selected from the group consisting of: a hydroxyalkylamide, pentaerythritols; mono, di and tri alkanol amines; glycols; abitol; butylene glycol; cyclohexanediethanol; diethylene glycol; dipentaerythritol; dipropylene glycol; glycerine; hexylene glycol; hydrogenated Bisphenol A; methyl 1,2 propanediol;

neopentylglycol; propylene glycol; sorbitol; triethylene glycol; trimethylolpropane; tripentaerythritol, alkoxy and hydroxyl alkoxy cellulose, simple sugars like fructose, sucrose, glucose and starches.

5 25. A one pass heat curable extruded adhesive laminate system, according to claim 15, wherein the extruded adhesive with a latent thermally activated is further comprised of a hydrolytic stabilizer.

10 26. The one pass heat curable extruded adhesive laminate system, as claimed in claim 25, wherein the hydrolytic stabilizer is selected from the group consisting of carbodiimides, polycarbodiimide and epoxidized soy bean oil.

15 27. The one pass heat curable extruded adhesive laminate system, as claimed in claim 15, wherein the thermoplastic resin is compounded to include other additives such as reinforcing fibers, fillers, antioxidants, UV stabilizers, thermal stabilizers, flame retardants, glass beads, colorants, antimicrobial agents, dyes, pigments, processing aides (i.e. waxes, fluorinated compounds, silicone compounds, surfactants, polymeric processing aides), density modifiers such as phenolic beads, desiccants, buffers, and IR absorbent compounds to facilitate heating (i.e. carbon blacks, graphite, metal oxides).

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28. The one pass heat curable extruded adhesive laminate system, as claimed in claim 15, wherein the said extruded adhesive is further compounded to include other additives such as reinforcing fibers, fillers, antioxidants, UV stabilizers, thermal stabilizers, flame retardants, glass beads, colorants, antimicrobial agents, dyes, pigments, processing aides (i.e. waxes,

fluorinated compounds, silicone compounds, surfactants, polymeric processing aides), density modifiers such as phenolic beads, desiccants, buffers, and IR absorbent compounds to facilitate heating (i.e. carbon blacks, graphite, metal oxides).

5 29. The heat curable extruded adhesive laminate system, as claimed in claim 10, wherein  
the hydroxyalkyamide is N,N,N',N'-tetrakis(2-hydroxyethyl)adipamide, or N,N,N',N'-  
tetrakis(2-hydroxypropyl)adipamide.

10 30. The heat curable extruded adhesive laminate system, as claimed in claim 29, wherein  
the hydroxyalkyamide is combined with triglycidyl isocyanurate.

31. The one pass heat curable extruded adhesive laminate system, as claimed in claim 24,  
wherein the hydroxyalkyamide is N,N,N',N'-tetrakis(2-hydroxyethyl)adipamide, or  
N,N,N',N'-tetrakis(2-hydroxypropyl)adipamide.

15 32. The one pass heat curable extruded adhesive laminate system, as claimed in claim 31,  
wherein the hydroxyalkyamide is combined with triglycidyl isocyanurate.

33. The heat curable extruded adhesive laminate system, as claimed in claim 12, wherein  
20 the hydrolytic stabilizer is comprised of bis(2,6-di-2- propylphenyl)carbodiimide.

34. The one pass heat curable extruded adhesive laminate system, as claimed in claim 26,  
wherein the hydrolytic stabilizer is comprised of bis(2,6-di-2- propylphenyl)carbodiimide.

35. A heat curable co-extruded adhesive laminate system, said system comprising:  
a fabric;  
a co-extruded adhesive having a latent thermally activated curing component comprising a uretdione, said extruded adhesive being coated onto the fabric; and  
5 a co-extruded thermoplastic resin, said thermoplastic resin being extruded adjacent to the co-extruded adhesive, thereby forming the heat curable extruded adhesive laminate.

36. A heat curable co-extruded adhesive laminate system, according to claim 1, said system further comprising heating panels of the heat curable extruded adhesive laminate to a  
10 temperature from about 260°F to about 350°F in a compression press, thereby forming collapsible tanks.

37. A heat curable co-extruded adhesive laminate system, as claimed in claim 36, wherein following heating, there are seams formed which have a strength that exceeds the minimum  
15 acceptable performance of 25 lbs/in, after being immersed in water and/or fuel at 160°F for six weeks.

38. A heat curable adhesive laminate system, as claimed in claim 2, wherein following heating, there are seams formed which have a strength that exceeds the minimum acceptable  
20 performance of 25 lbs/in, after being immersed in water and/or fuel at 160°F for six weeks.

39. A one pass heat curable extruded adhesive laminate system, as claimed in claim 16, wherein following heating, there are seams formed which have a strength that exceeds the

minimum acceptable performance of 25 lbs/in, after being immersed in water and/or fuel at 160°F for six weeks.